Laptop Use By Seventh Grade Students with Disabilities:

Perceptions of Special Education Teachers

Maine Learning Technology Initiative

Research Report #2

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Executive Summary

This study used a mail survey to examine special education teachers' perceptions of the use and impact of one-to-one laptop computers provided to seventh grade students with disabilities and their teachers by the Maine Learning Technology Initiative (MLTI). Overall, special education teachers viewed the laptops as highly beneficial to their students with few exceptions.

The laptops were credited with improving the engagement of students with disabilities with their school work; increasing their motivation and ability to work independently; and improving their class participation, interaction with other students, interaction with teachers, and class preparation.

Special education teachers and parents indicated that the laptops also increased students' personal organization. Assignments and student work were more frequently organized in "folders" on the "desktop" of their laptop computers. Material was more easily organized by subject area and electronically filed.

Another important finding of this study was that special education teachers perceived their special education students to have increased the quality and quantity of their writing. For many of these students, the laptops removed the motor coordination challenge of writing with pen and pencil and allowed them to produce work that was easily edited and looked as good as the work of their non-disabled peers.

The laptops were perceived to be of clear benefit to the majority of students with disabilities who were taught by special education teachers responding to the survey. However, there were a few exceptions. Students who were highly distractible, blind and partially sighted students, and highly anxious students with low tolerance for frustration were all described as students who could not benefit from the use of laptops.

Another finding of the study was that the general nature of a student's disability did not determine whether or not a laptop would be perceived as an effective instructional tool. Most special education teachers described how the laptop computer was of benefit to highly distractible students, while a few described the laptop as yet another distraction. Most students with disabilities were highly motivated by their laptops, while a few were frustrated by minor glitches with the technology and avoided use of the laptop.

The study concludes that special education teachers perceive laptop computers to be highly effective instructional tools for students with disabilities. Teachers are cautioned, however, to carefully match the characteristics and challenges of using the laptop to the skills, learning styles, and frustration tolerance levels of their students.

LAPTOP USE BY SEVENTH GRADE STUDENTS WITH DISABILITIES: PERCEPTIONS OF SPECIAL EDUCATION TEACHERS

The Maine Learning Technology Initiative (MLTI) provided laptop computers to all seventh grade students and their teachers in Maine and included professional development for teachers and wireless networks for every school building. In May of 2003, late in the first year of state-wide implementation of the MLTI, a survey was mailed to all middle school special education teachers ($N = 749$) to gather information about their use of the laptops and their perceptions of the use of laptops by their special education students. The survey is included in the Appendix.

Characteristics of the Special Education Teachers and Students

Special Education Teachers

Two hundred and ninety-three surveys were returned (39%). Of these, 86 special education teachers indicated that they did not have seventh grade students as part of their case loads leaving 207 special education teachers or 28% of the original sample as the sample for this study. Eighty percent of this sample had been teaching two years or more and had therefore been teaching in special education prior to the beginning of the MLTI program. One hundred and sixty-one or 78% of the seventh grade special education teachers in this sample received laptop computers as part of the MLTI program.

Special education teachers were asked to indicate which of the following program titles best described the special education program in which they worked: self-contained, resource room, consulting program, composite program, or other. Forty-two percent of the teachers indicated that they worked in a resource program, 17% in a self-contained program, 9% in a composite room program, and 2% in consultant programs. Thirty percent of the entire sample responded that they worked in multiple programs or "other" programs.

Forty-nine percent of the special education teachers reported that they participated in MLTI sponsored professional development, and 94% of these respondents indicated that the training was beneficial. Seventy-one percent indicated that they would benefit from additional training.

Special Education Students

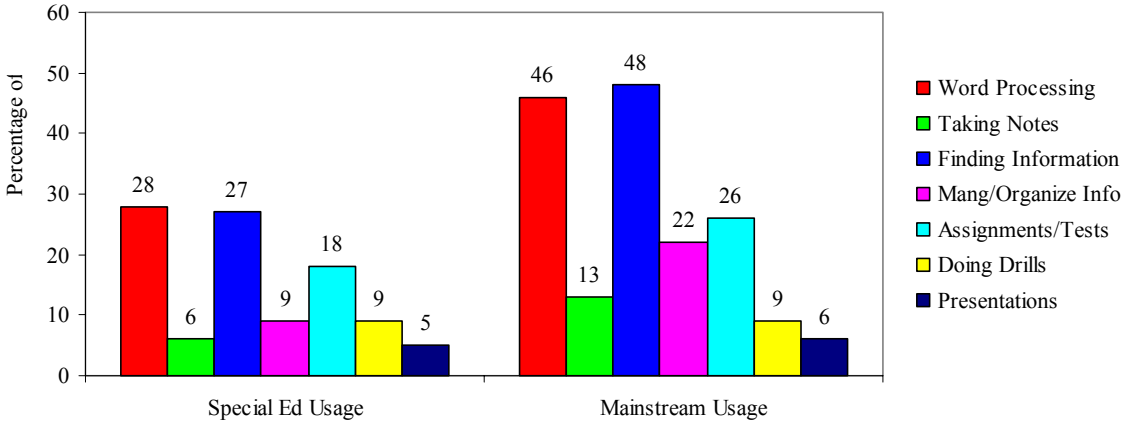
The average number of students with disabilities on the caseloads of these special education teachers was 17, including both seventh and eighth grade students. The average number of seventh grade students was seven. Ninety-four percent of all seventh grade special education teachers indicated that their seventh grade special education students received laptop computers.

Most special education students received laptops computers due to their status as seventh graders. However, 20% of the special education teachers indicated that some of their students received laptops because they were required in their Individual Education Plans (IEPs). Learning disabilities, other health impairment, emotional disabilities, and speech and language impairment were the most frequent disabilities of students whose IEPs required that they have laptop computers.

Students with Disabilities Use of Laptops

Special education teachers were asked to indicate how frequently their special education students used laptop computers in their mainstream classrooms and in special education resource and composite rooms for seven specific purposes. One hundred and ninety teachers responded to this question. Figure 1 reports teachers' perceptions of laptop use by students with disabilities in special education settings and mainstream settings.

Figure 1. Percent of Special Education Teachers Indicating Daily* Usage of Laptops in Special Education and Mainstream Settings



*Daily is defined as once a day or often during the day.

Figure 1 indicates that finding information and word processing were the most frequent uses of laptops by students with disabilities in both special education and mainstream settings. Special education teachers perceived that their students used laptops more frequently in their mainstream classrooms than in special education settings but generally for the same purposes.

Further analysis of these data indicated no significant differences between the responses of special education teachers in self-contained programs, composite programs, and resource programs. No significant differences existed between the responses of special education teachers who had been teaching from one to five years and those who had been teaching six years or more.

Laptop Impact on the Overall Performance of Students with Disabilities

Special education teachers were asked to rate the impact of laptop computers on various aspects of classroom performance and students' dispositions on a scale that ranged from 1 = declined, to 6 = improved. For purposes of analysis, this data was combined into three directional categories of impact: declined, no impact, and improved.

All aspects of classroom performance were perceived to be improved as a result of the laptops. These data are represented in both Figures 2 and 3. As indicated in Figure 2, engagement/interest level, motivation, and ability to work independently were rated as improved by the highest percent of special education teachers.

Figure 2. Percent of Special Education Teachers' Ratings of Laptop Impact on Students' Performance in Selected Areas

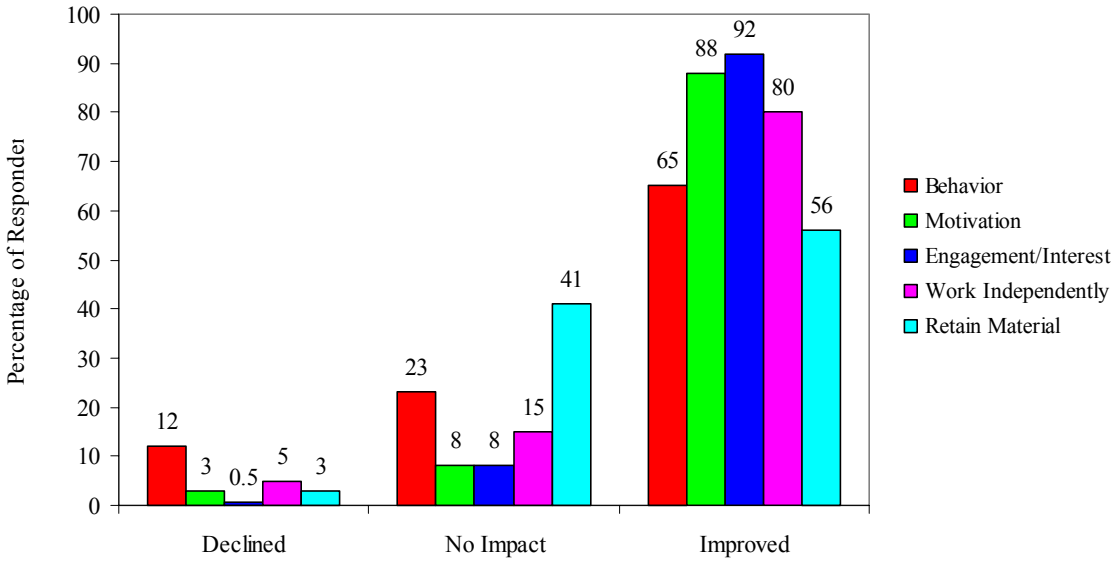
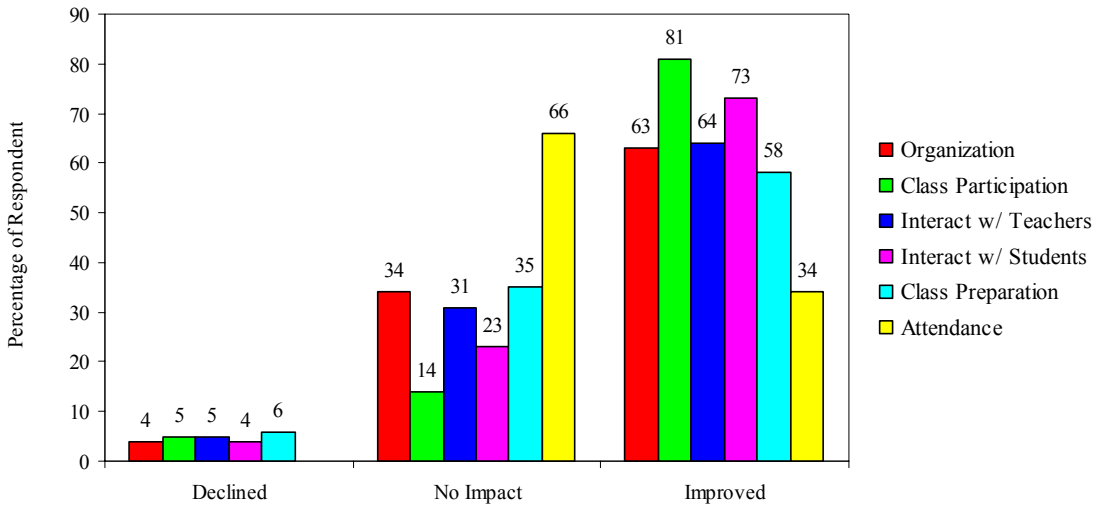


Figure 3 indicates that the majority of special education teachers perceived the impact of the laptops on students with disabilities to be in the areas of class participation, interaction with students, interaction with teachers and organization. Sixty-six percent of special education teachers indicated that the laptops had no impact on students' attendance while 34% indicated that there was improvement on this aspect of students' behavior.

Figure 3. Percent of Special Education Teachers Ratings' of Laptop Impact on Students' Performance in Selected Areas



Special Education Teacher Experience and Perceptions of the MLTI

Special education teachers were asked to provide their overall impression of the laptop program for students with disabilities. Seventy-one percent of teachers with less than five years experience rated the MLTI as positive or very positive. Eighty-one percent of teachers with six or more years of experience provided the same ratings. These data suggest that special education teachers with more experience perceive greater value in the use of laptop computers for students with disabilities than do special education teaches with less experience (p = .04).

Students with Disabilities Who Benefit from Laptops.

Special education teachers were provided with the following prompt:

> *If the use of a laptop has had a positive impact on at least one student on your caseload, briefly describe the benefits to that student.*

One hundred and seventy teachers responded to this item in various ways. The predominant positive impacts that the teachers described were in the areas of writing, organization, motivation, and self-esteem. The following quotations are representative of the teachers' responses.

> Writing
>
> One student who has historically been a very reluctant writer is now able to compose full essays. His writing has been shared with his last years' special ed. teacher who could not believe it was the same child.

One student refused to complete writing assignments for over a year, and required a pullout writing class. Now he has increased the length of his writing and the quantity/quality of his work. He is currently earning an "A" in his regular education classroom writing class. He has been motivated by the laptop.

I have a student that reads at the second grade level. He can type in the instructions on the board and have the computer read them to him. As he writes in English class, he continually has the story re-read to him [by the computer] to stay up with the story and make corrections.

Organization

A student with severe ADHD has been able to focus and be more organized in academic classes.

I have a student that was extremely disorganized, never completed homework and was always behind. Having a laptop has promoted this student's self esteem. Parents have also purchased a computer at home and have taken a parent class here at school. They are supportive of the program. The student has become much more organized and has no excuses for not having homework completed. The teachers e-mail assignments.

Writing and organization of writing have seemed to come easier. The students using programs like Inspiration can web out their writing.

One student emails assignments to his parents daily to keep organized.

Motivation

I have a particular student with OHI diagnosis. He has been extremely motivated by the laptops, and I have seen growth in his writing. He uses spell check . . . a huge improvement.

This student really wasn't motivated to do school work. Once the laptops were introduced, she began working harder and we saw much improvement in her work.

This student had little self-esteem or self-motivation. Reading skills were very poor. He has done exceptionally good work using the laptop and is extremely motivated.

Self-esteem

> Self-esteem is the biggest improvement with my seventh graders. Kids who have always been left out are now feeling like all the other kids. They are also so proud of the projects and presentations they can produce with the help of the laptop.
>
> This female student has been able to keep up with her peers. She is not having to take as much home and have to complete it with the aid of her parent. It has given her a sense of pride and has done wonders for her self-confidence.
>
> This has given him a sense of independence and self-confidence. He has been very isolated in the past. . . . It has benefited him in being accepted in the larger group as a class participant. So often these children are not included in such endeavors or are looked at as different.

Students with Disabilities Who Did Not Benefit from Laptops

Special education teachers responded to the following prompt:

> *If the use of a laptop has had no impact or a negative impact on at least one student on your caseload, briefly describe.*

Eighty-nine teachers responded to this prompt. Responses fell into three categories that have been titled distractibility, disability, and organization.

Distractibility

A majority of responses described highly distractible students for whom the laptop was and additional distraction or provided increased stimuli that detracted from instruction.

> I have observed that with one of my students the use of a laptop has had a negative impact. Due to this student's disability, the laptop has been a distraction. He is constantly fiddling with other programs and surfing the net when not appropriate during instructional time.
>
> I have several students identified with ADD. The laptops have been used under restricted guidelines. These students are over-stimulated, especially when trying to conduct research.

Disability

Responses that indicated that the nature or severity of a students' disability made use of the laptop difficult or impossible were included in this category.

> The laptop is not compatible for students who are blind. Therefore, a different computer once again makes my students stand out as different and not have the same accessibility to information that her typical peers have.
>
> I have one student who had extreme difficulty managing the computer. He refused to stop using it when asked and eventually asked to have it taken away because it was "controlling" him.
>
> A seventh grade male with very high anxiety levels and low frustration tolerance cannot cope when the network is down, the program freezes or the website is inaccessible.
>
> I have one LD/reading student who is frustrated at not being able to read the content on the Internet.

Organization

A final category of responses included descriptions of students for whom organization of their school work and sequencing of tasks were frequently a challenge without a laptop.

> One student with severe organization problems hoped that the laptop would help. His laptop is now filled with untitled files or files with undecipherable names and the student refuses to organize them just like he did with his binders.
>
> I have a student who grows increasingly frustrated as assignments on the laptop go at a faster and faster pace. The change from screen to screen can be too rapid for a slow processor of information and almost too visually stimulating in its change from one example to another.
>
> Several of my students get lost in the file and screen structure and layers while working on their laptops.

Summary

This study examined special education teachers' perceptions of Maine's Learning Technology Initiative (MLTI) and its impact on students with disabilities. Overall, special education teachers perceive the MLTI as highly beneficial to their students. Students with disabilities use their laptops primarily for finding information and word processing, though somewhat less in special education settings than in mainstream classrooms.

Specific impacts of the MLTI laptops on students with disabilities include improved engagement and interest in school work, motivation, and ability to work independently. MLTI laptops were also attributed with improvement in students' class participation,

interaction with students, interaction with teachers, organization, and class preparation. The laptops were not viewed by special education teachers as having a major impact on the attendance of students with disabilities.

When asked to describe students with disabilities who benefited from the use of a laptop, the majority of teachers described students who had difficulty writing. Many students with disabilities have difficulty with handwriting and using laptops as word processors appears to increase motivation to write, the quantity of writing, and the quality of writing.

Organization of school work was another frequently described benefit of laptops to students with disabilities. Laptops were attributed with helping students organize assignments, resource material, and homework more effectively.

Students with disabilities were also perceived by their teachers to be more motivated to do their school work than prior to the use of laptops. Improved motivation was often coupled with improved quality of work and increased task completion in the perceptions of their teachers.

Finally, special education teachers described students whose self-esteem was improved by the use of laptops. The ability to produce school work that was more similar in appearance to their non-disabled peers was one factor that improved self-esteem. Another factor was the ability of some students with disabilities to master certain aspects of specific software to the degree that they became helpers to others.

When prompted, special education teachers were also able to describe students for whom laptops were not beneficial. The most frequently occurring description was of students who were typically highly distractible and found it difficult to focus on an academic task for very long. For some of these students the laptop was another distraction. The capabilities of the laptop to move quickly from one topical web page to another nurtured students' already short attention spans.

There were also students described whose disabilities made the laptop difficult or impossible to use. Blind and partially sighted students, highly anxious students, and students with low tolerance for frustration were all described as students who did not benefit from the use of laptops.

Special education teachers also described some students with organization problems as being unable to understand and use the multiple layers and organizational structure of computer-based information.

Conclusions

The data produced by this limited sample of middle school special education teachers suggests the following conclusions:

- The primary uses of laptops by students with disabilities include finding information and word processing. These students use their laptops more often in mainstream classrooms than in special education settings though they are used for the same purposes.

- Most special education teachers perceive that students with disabilities gain significant benefit from the use of laptop computers. These benefits include improved writing, organization, motivation and self-esteem.

- There are some students who do not benefit from laptops due to the unique characteristics of their disabilities and the title of a disability does not denote which students will benefit and which will not. For example, teachers described distractible students who benefited from the laptop because of their ability to focus on and control the visual stimuli and the pace with which new stimuli are presented. Special education teachers also described highly distractible students who did not benefit from the use of laptops but instead became more distractible. Similarly, while some students with disabilities become highly engaged and motivated by using a laptop, others are easily frustrated by minor software and hardware glitches and quickly abandon their laptops.

- Laptops, as with any educational tool or instructional material, must be used with knowledge of students' abilities and disabilities. Although the benefits of using the laptop computer as an instructional tool and resource for students with disabilities seems generally apparent, teachers are cautioned to carefully match the characteristics and challenges of using a laptop to the skills, learning styles, and frustration tolerance levels of their students.

Appendix

Survey of Middle School Special Education Teachers

This survey is designed for special education teachers who provide special education services to seventh grade students. If you do not provide special education services to seventh grade students, please check here ❒ and return this survey in the enclosed envelope.

SPECIAL EDUCATION QUESTIONNAIRE

1. How long have you been teaching special education?

   ❒ 1 year ❒ 2-3 years ❒ 4-5 years ❒ 6-10 years ❒ More than 10 years

2. How long have you been teaching special education **at this school**?

   ❒ 1 year ❒ 2-3 years ❒ 4-5 years ❒ 6-10 years ❒ More than 10 years

3. How would you best describe the special education program at your school?

   ❒ Self-contained classroom ❒ Consulting program ❒ Composite classroom
   ❒ Resource program ❒ Other _____

4. How many students are on your caseload (all grades)? _____

5. How many of these students are in the seventh grade? _____

6a. Did all of your seventh grade students receive laptops? ..... ❒ Yes ❒ No
6b. If no, were you included in the decision making process not to provide a laptop to some students? ..... ❒ Yes ❒ No

7a. Did you receive a laptop from the MLTI program? ..... ❒ Yes ❒ No
7b. If no, did your school provide you with a laptop? ..... ❒ Yes ❒ No
7c. If no to 6a and 6b, do you have a laptop to use with your students? ..... ❒ Yes ❒ No

8a. Did you attend **MLTI sponsored** training for the laptops? ..... ❒ Yes ❒ No
8b. If yes to 8a, was the training beneficial? ..... ❒ Yes ❒ No

9a. Did you attend **district sponsored** training for the laptops? ..... ❒ Yes ❒ No
9b. If yes to 9a, was the training beneficial? ..... ❒ Yes ❒ No
10. Do you need additional training in the use of laptops to support your students' needs? ..... ❒ Yes ❒ No

11. Please indicate how frequently students on your caseload use laptops **in mainstream classrooms** for activities directed by general education teachers.

❒ Check here if you do not have any students in mainstream classrooms.

How often do students on your caseload use laptops in the mainstream classrooms for activities directed by general education teachers for each of the following:	**Never**	**Less than once a week**	**Once a week**	**A few times a week**	**Once a day**	**Often during the day**	**Do not know**
Word processing	1	2	3	4	5	6	7
Taking notes on the computer	1	2	3	4	5	6	7
Finding information	1	2	3	4	5	6	7
Managing/organizing information	1	2	3	4	5	6	7
Completing assignments/taking tests	1	2	3	4	5	6	7

	Never	Less than once a week	Once a week	A few times a week	Once a day	Often during the day	Do not know
Doing drills to increase competency (education drill software, online quizzes, FunBrain, etc.)	1	2	3	4	5	6	7
Creating presentations to show what they have learned (web pages, multimedia projects, etc.)	1	2	3	4	5	6	7
Other:	1	2	3	4	5	6	7
Other:	1	2	3	4	5	6	7

12. Please indicate how frequently students on your caseload use laptops when they are working directly with you.

While working directly with you, how frequently do your students use their laptops for each of the following:	Never	Less than once a week	Once a week	A few times a week	Once a day	Often during the day
Word processing	1	2	3	4	5	6
Taking notes on the computer	1	2	3	4	5	6
Finding information	1	2	3	4	5	6
Managing/organizing information	1	2	3	4	5	6
Completing assignments/taking tests	1	2	3	4	5	6
Doing drills to increase competency (education drill software, online quizzes, FunBrain, etc.)	1	2	3	4	5	6
Creating presentations to show what they have learned (web pages, multimedia projects, etc.)	1	2	3	4	5	6
Other:	1	2	3	4	5	6
Other:	1	2	3	4	5	6

13a. Do the IEPs of any of your students specify that they will use a laptop? ..... ❒ Yes ❒ No

13b. If yes, how many students' IEPs specify that they will use a laptop? _____

13c. If yes, please list the primary disabilities these students have. (1)_____

(2) _____ (4) _____

(3) _____ (5) _____

14a. Is there a need for additional software for some students? ..... ❒ Yes ❒ No

14b. If yes, please list the software. _____

15a. Is there a need for additional hardware for some students? ..... ❒ Yes ❒ No

15b. If yes, please list the hardware._____

16. Through personal observation or discussions with regular classroom teachers, how do you believe the laptops have impacted special education students' **overall performance** in each of the following areas?

Areas	Declined	Slightly declined	No impact	Slightly improved	Improved
Organization	1	2	3	4	5
Participation in class	1	2	3	4	5
Interactions with teachers	1	2	3	4	5
Interactions with other students	1	2	3	4	5
Preparation for class	1	2	3	4	5
Attendance	1	2	3	4	5
Behavior	1	2	3	4	5
Motivation	1	2	3	4	5
Engagement/interest levels	1	2	3	4	5
Ability to work independently	1	2	3	4	5
Ability to retain content material	1	2	3	4	5
Other:	1	2	3	4	5
Other:	1	2	3	4	5

17. What is your overall impression of the laptop program as it has been used for students with disabilities?

❒ Very positive ❒ Positive ❒ Neutral ❒ Negative ❒ Very negative

18. If the use of a laptop has had a positive impact on at least one student on your caseload, briefly describe the benefits to **one** of your students.

_____
_____
_____
_____
_____
_____

19. If the use of a laptop has had no impact or a negative impact on at least one student on your caseload, briefly describe the implications for **one** student.

_____
_____
_____
_____
_____
_____

Additional Comments:

_____
_____
_____
_____
_____